DEVELOPMENT OF SEX PHEROMONES FOR MANAGEMENT OF COCOA MIRIDS IN WEST AFRICA

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INSECT PEST PROBLEMS

Cocoa mirids, *Sahlbergella singularis* and *Distantiella theobroma*, are the most important major pests in Ghana

They do similar damage which results in about

25-30% reduction in yield

Photos: N. Jessop

MIRID DAMAGE

- Mirid bugs cause lesions on pods
- Destroy immature pods
- Destroy growing point
- Destroy trees
- Promote fungal infection (*Albonectria rigidiuscula*)

CONTROL OF MIRIDS

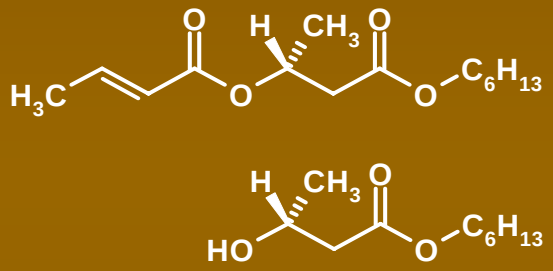
- Mirids are controlled by the application of conventional insecticides only. Foliar application Four times/year---August-December monthly, November omitted

- Problems
- Alternative method--IPM
  - female mirid pheromone
  - fungal pathogens

Pheromone studies

Previous work done

- Novel pheromone components identified and synthesised for both species



- Synthetic pheromone attracts males

- Sticky trap (NRT) designed by CRIG and NRI and tested by farmers

- Trapping parameters determined (Inconclusive)

-Vertical placement of trap

-Lure age

-Trap density

Current studies

- Determination of optimal blend.

  Using a trap, NRT, a range of five blends plus a blank control were tested in a RCBD experiment, replicated 8-fold, since April 2007, at Akwadum, on farmers' organic cocoa farms.

  Data analysis by anova

Blends (diester: monoester) tested

- A-1000:0
- B-1000:50
- C-1000:500
- D-1000:1000
- E-0:1000
- F-unbaited control

TRAP DESIGNS

Mass Trapping -- Acherensua

Started January 2008 –ongoing

150 traps per hectare

8 replicates,

0.5ha plot each for treatment and control

Big water bottle

Blend, 1000:1000

Results:

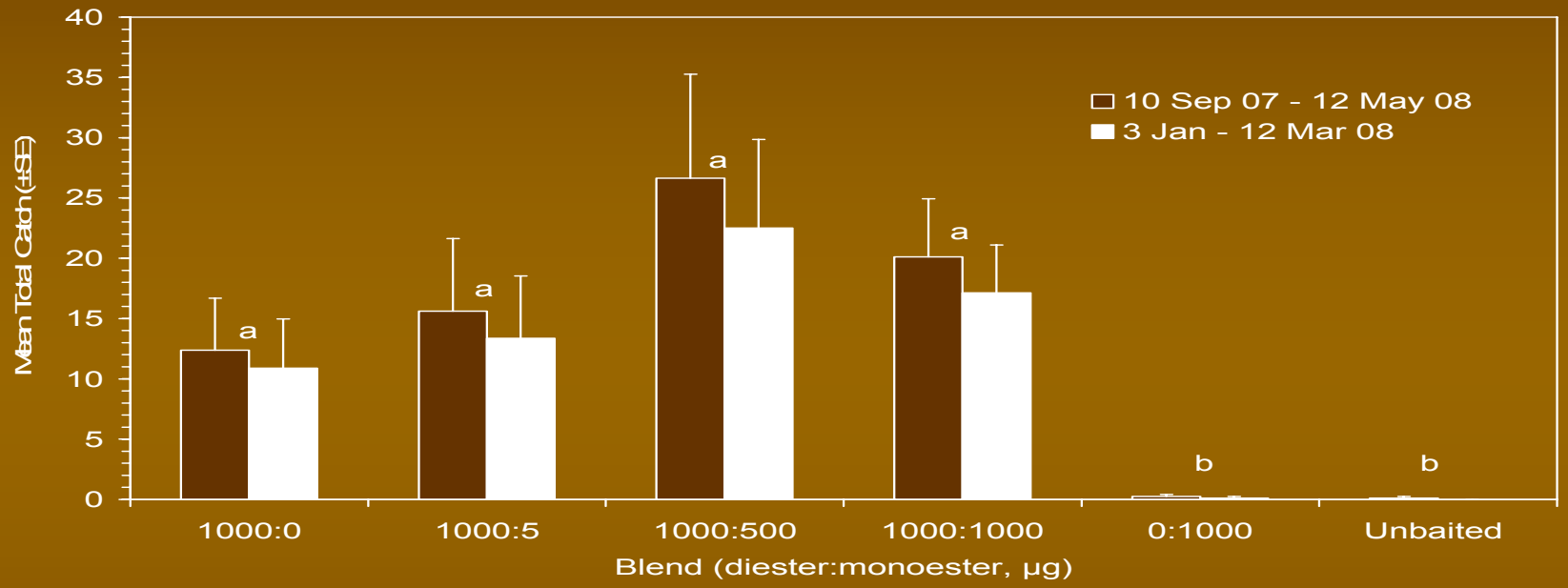


Fig. 1: Mean total catches(± SE) in NRT traps baited with different blends of diester:monoester pheromone components at Akwadum (bars with different letters are significantly different $P < 0.05$ by LSD test after transformation of data to log(x+1) and analysis of variance).

Results:

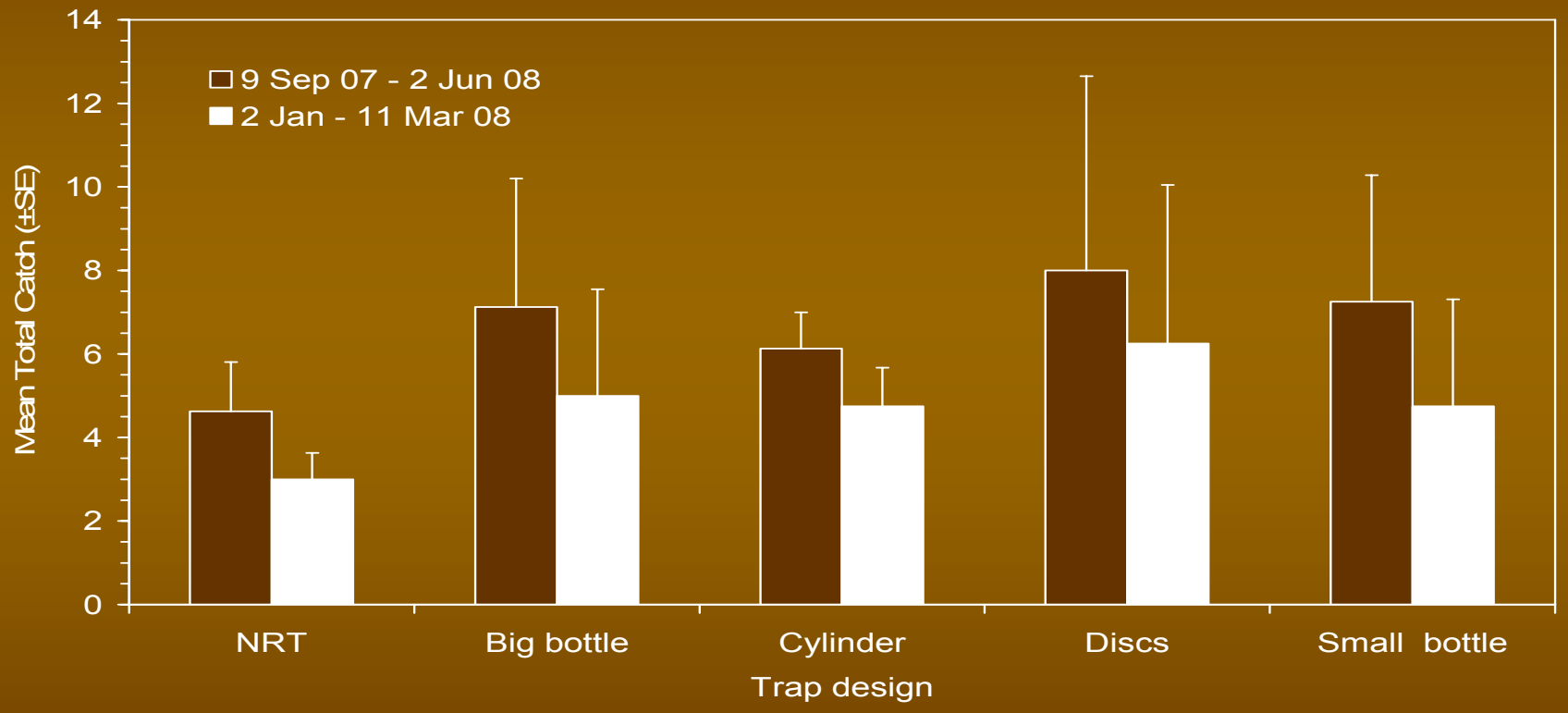
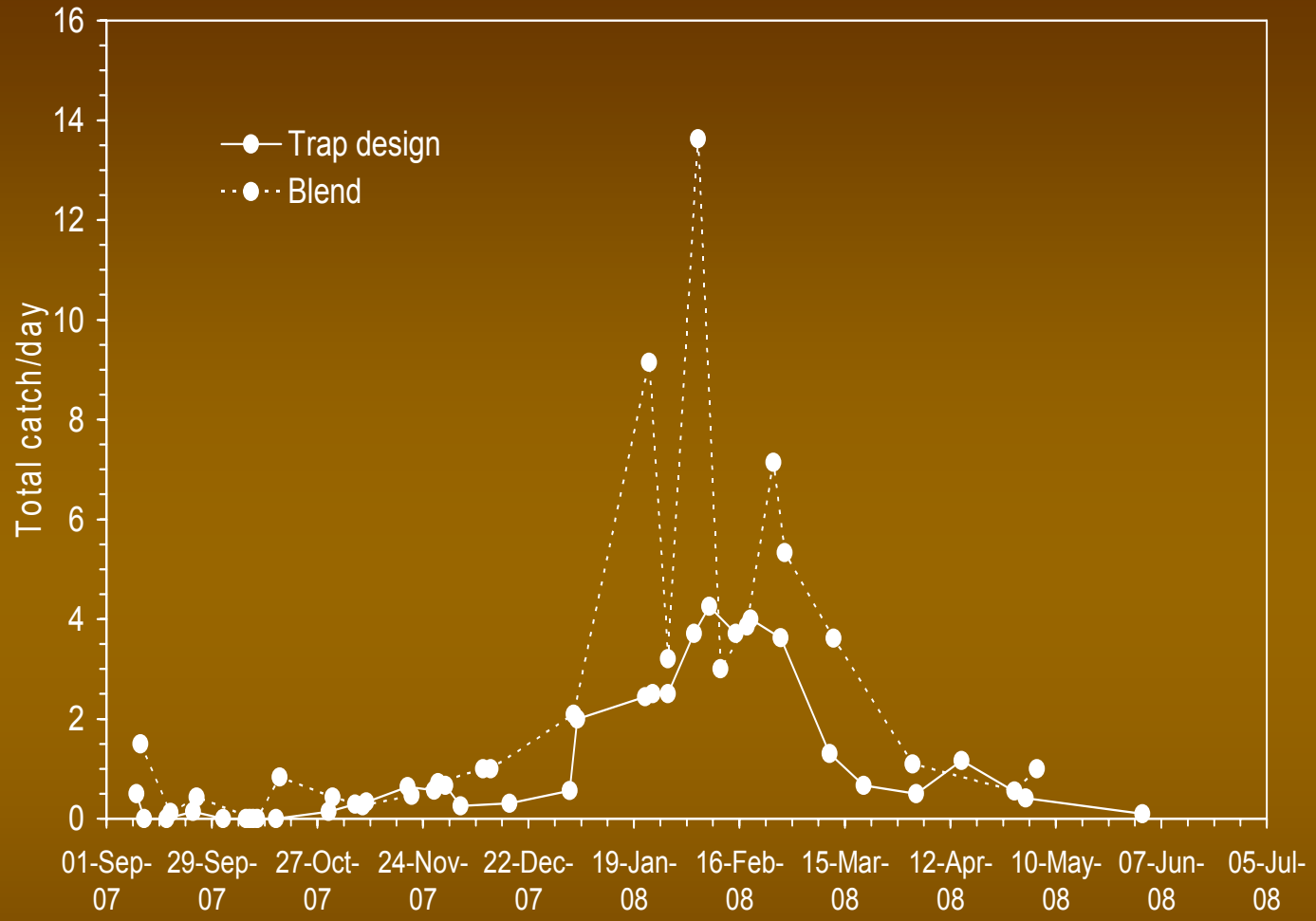
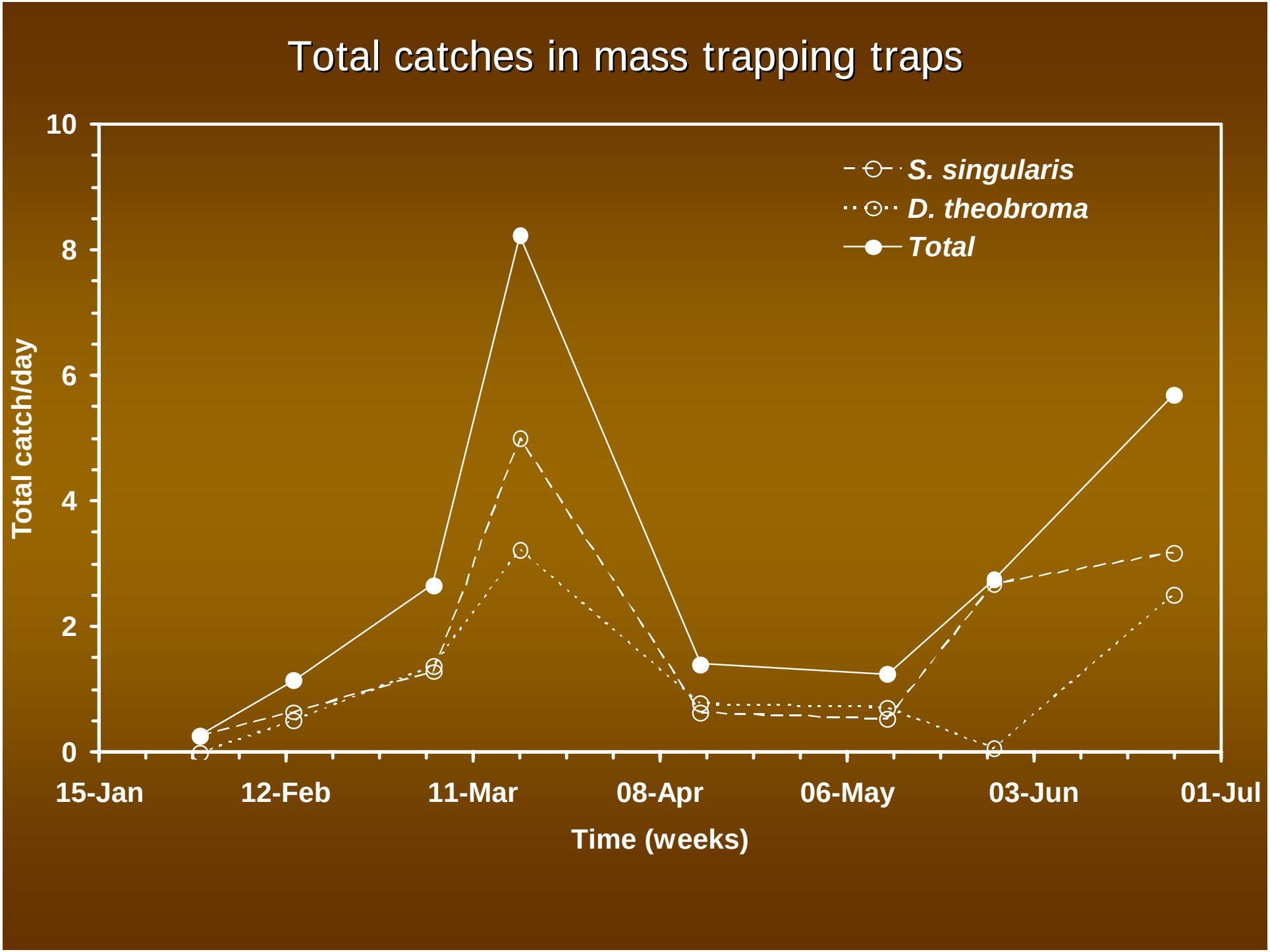


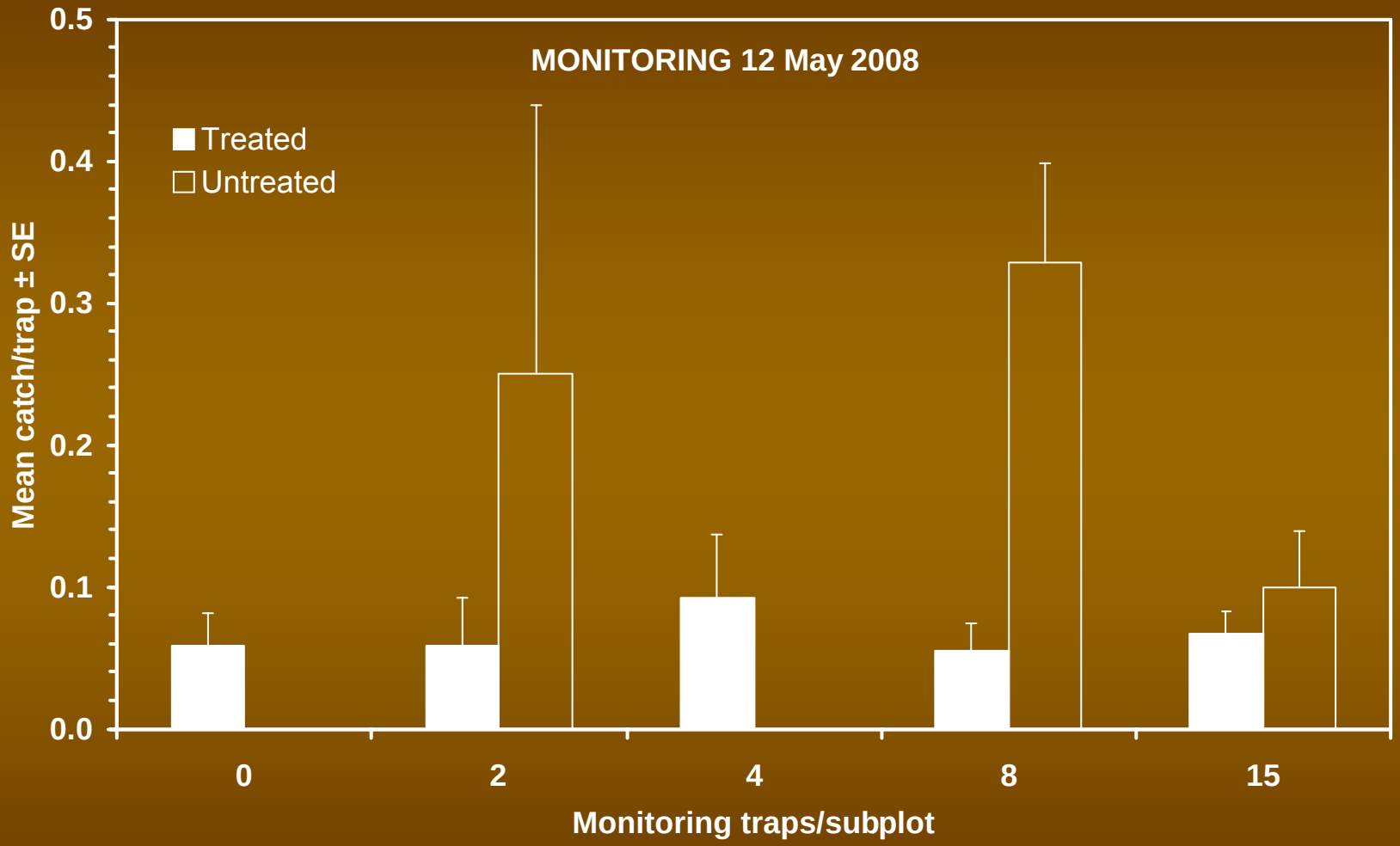
Fig.2. Mean total trap catches (± SE) in different designs of traps at Akwadum (8 replicates)

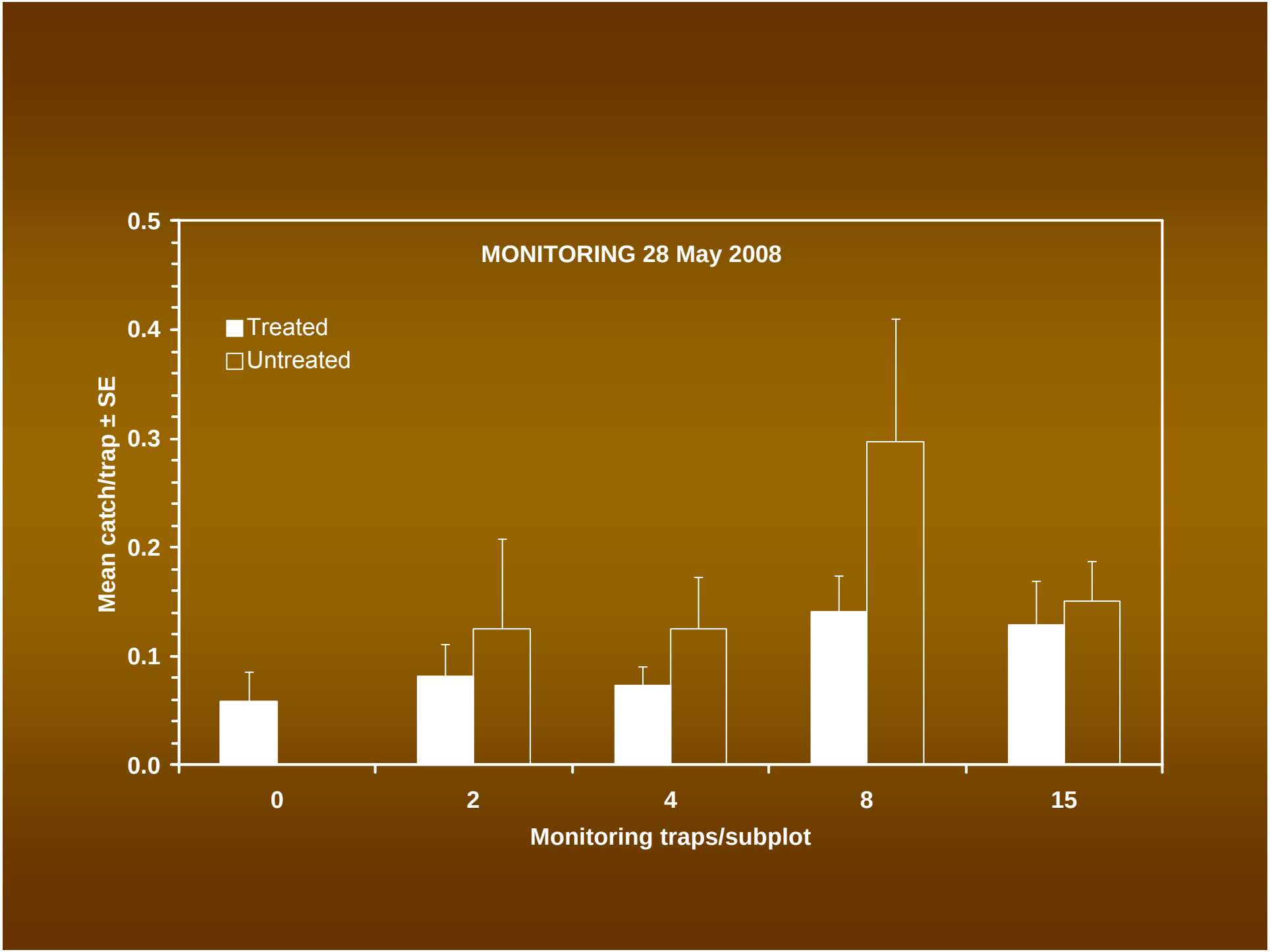
Trap Design and Blend catches (Akwadum)

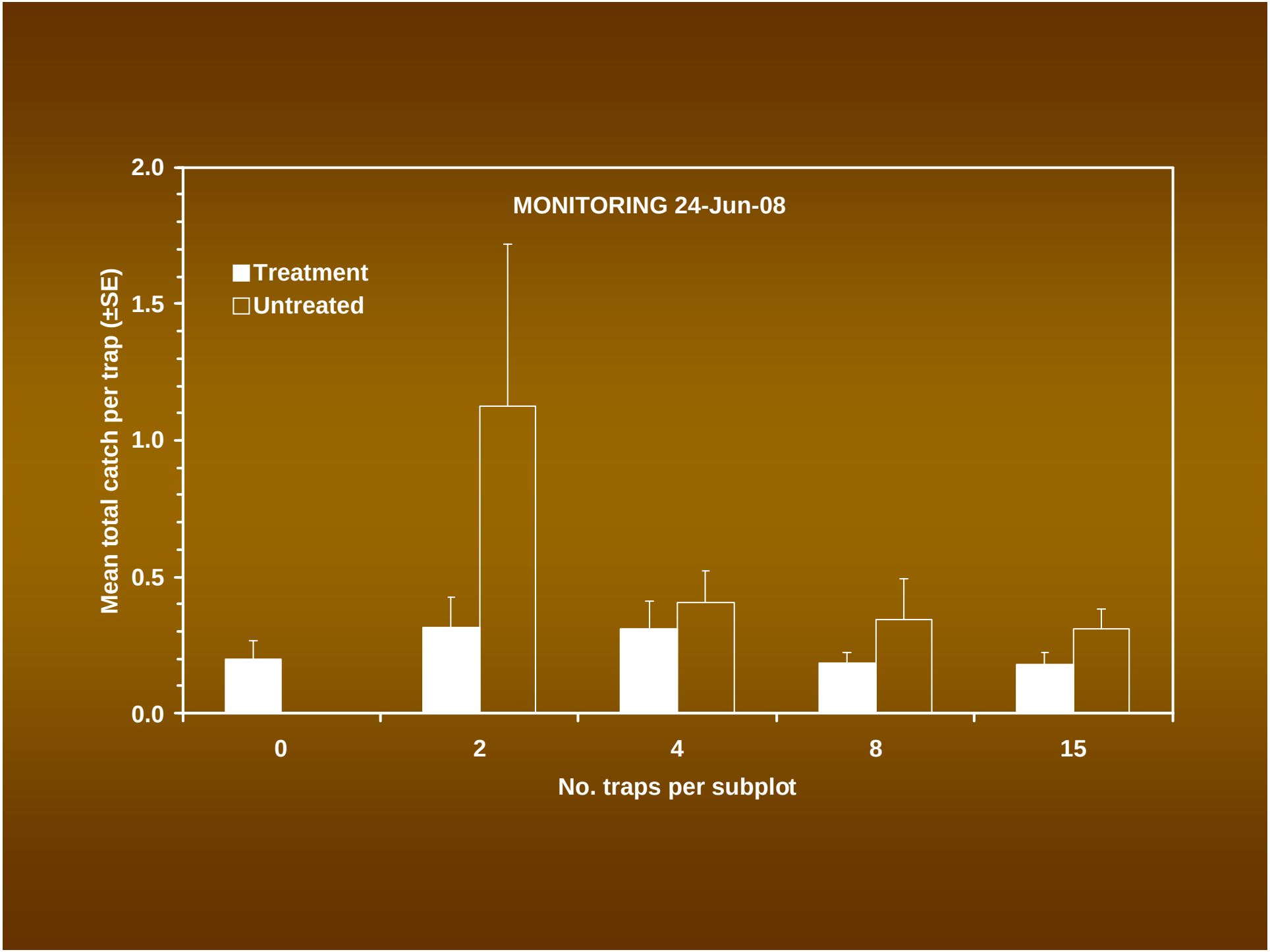


- Catches reflective of seasonal incidence of mirids in the area
- Potential for monitoring

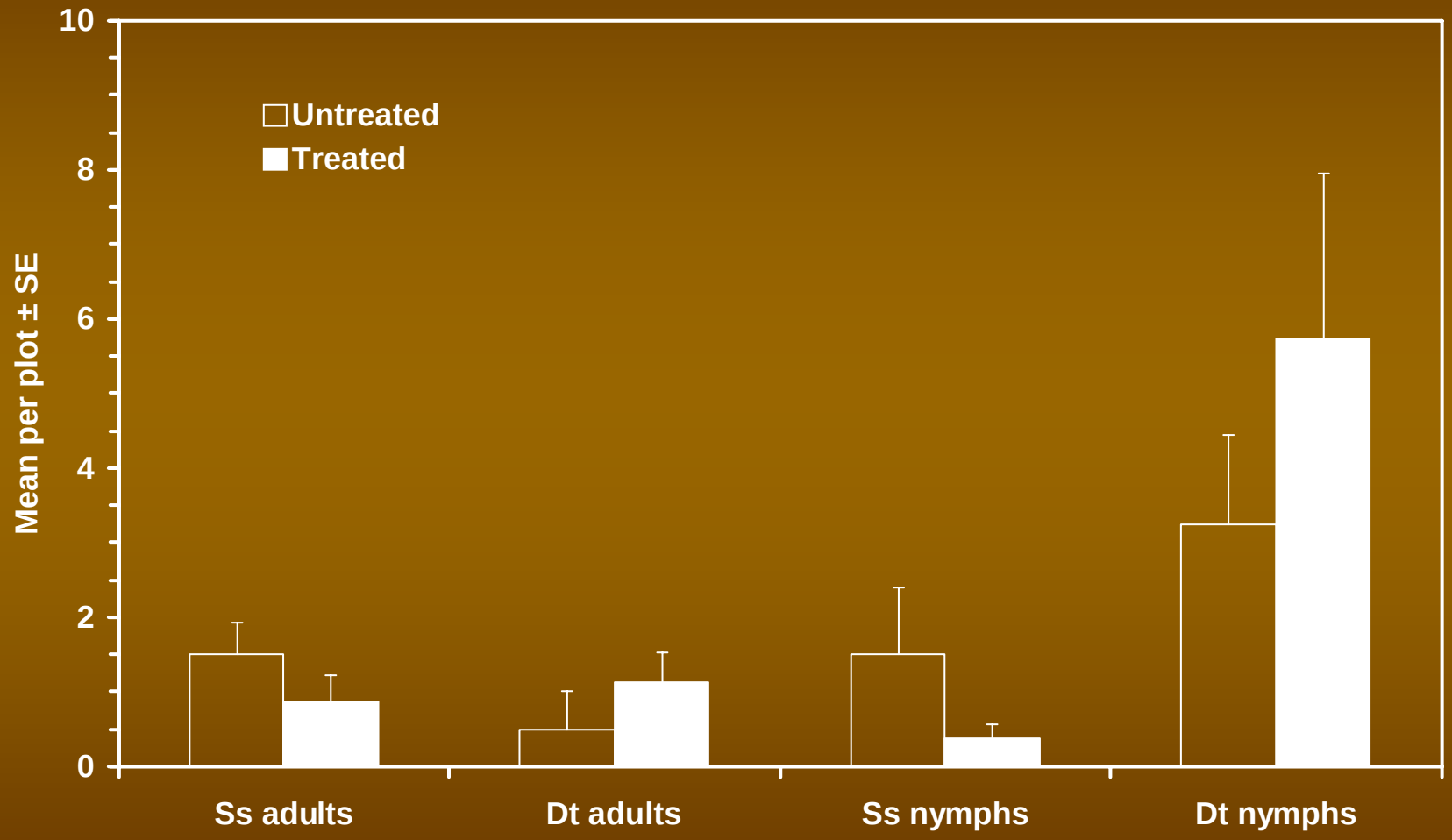

Total catches in mass trapping traps
10
8
6
4
2
0
Total catch/day
S. singularis
D. theobroma
Total
15-Jan
12-Feb
11-Mar
08-Apr
06-May
03-Jun
01-Jul
Time (weeks)


MONITORING 12 May 2008
Treated
Untreated
Mean catch/trap ± SE
0.5
0.4
0.3
0.2
0.1
0.0
0
2
4
8
15
Monitoring traps/subplot


MONITORING 28 May 2008
Treated
Untreated
Mean catch/trap ± SE
0.5
0.4
0.3
0.2
0.1
0.0
0
2
4
8
15
Monitoring traps/subplot


MONITORING 24-Jun-08
Treatment
Untreated
Mean total catch per trap (±SE)
2.0
1.5
1.0
0.5
0.0
0
2
4
8
15
No. traps per subplot

Knockdown


10
8
6
4
2
0
Mean per plot ± SE
Untreated
Treated
Ss adults
Dt adults
Ss nymphs
Dt nymphs

Mass trapping plots

CONCLUSIONS

- Prospects for improving management of mirids through pheromone trapping are good though the patchy distribution of the insects presents experimental challenges.
- There is probability of its use as a monitoring tool and possibly in mass trapping and mating disruption either or all of which would lead to reduction in the application of chemical insecticides.
- Also, farmers are already enthused about the technology and there is goodwill among other stakeholders.

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THANK YOU